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Supplemental Material

Airborne Fine Particles and Risk of Hospital Admissions for Understudied Populations: Effects by Urbanicity and Short-Term Cumulative Exposures in 708 U.S. Counties

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Figure S4. Percent increase in hospital admissions associated with a $10\mu g/m^3$ increase in $PM_{2.5}$ concentration, estimated using monitoring data (gray) and downscaler output (black), only for counties with monitoring data (CMAQds_subset), by level of urbanicity (lag 0) Vertical lines represent 95% posterior intervals. Urbanicity is measured as percent of county population residing in nonurban areas

Tables

Table S1. Characteristics of $PM_{2.5}$ pollution data/output

	Monitoring data	**CMAQds output**
Data description	Federal Reference Method ambient air quality monitors	Daily predictions of pollutant concentrations at Census Tracts centroids from combination of ambient monitoring data and CMAQ v4.6 output
Spatial form of concentration observation/estimate	Point	Point
Spatial resolution of original dataset	Variable	Variable
Temporal resolution	Variable, ~1 observation/3 days	Daily, every day
Method(s) used to estimate county level concentration	Monitor(s) within given county averaged	Population weighted Census Tracts to estimate county level conc.
Spatial coverage of exposure estimates	~418 counties	~2,818 counties

Table S2. Summary statistics of model evaluation for 24-h average $PM_{2.5}$ county level exposure estimates[a,b]

EvaluationMetric	Value
Mean daily county level concentration	
CMAQds	12.28 $\mu g/m^3$
CMAQds_subset	12.60 $\mu g/m^3$
Observed (monitor-derived)	12.48 $\mu g/m^3$
Normalized mean bias (NMB) (%)	0.95%
Normalized mean error (NME) (%)	9.75%
Mean correlation (standard deviation)	0.97 (0.032)

[a] Formulas and further description of metrics of model performance are presented in Zhang et al. 2006.
[b] The mean correlation refers to the mean correlation between monitor-derived and CMAQds-derived exposure estimates within a county (and not correlations across all counties and days).

Figures

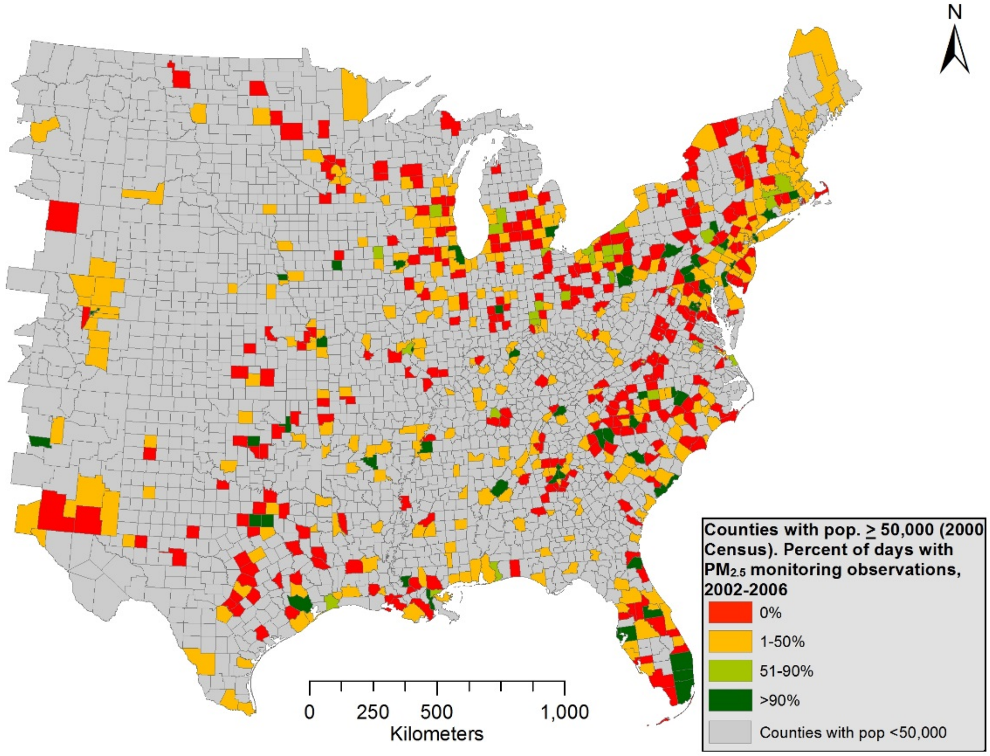


Figure S1. **Availability of monitor data by county for the study area (data from 2000 U.S. Census; map created using ArcGIS).**

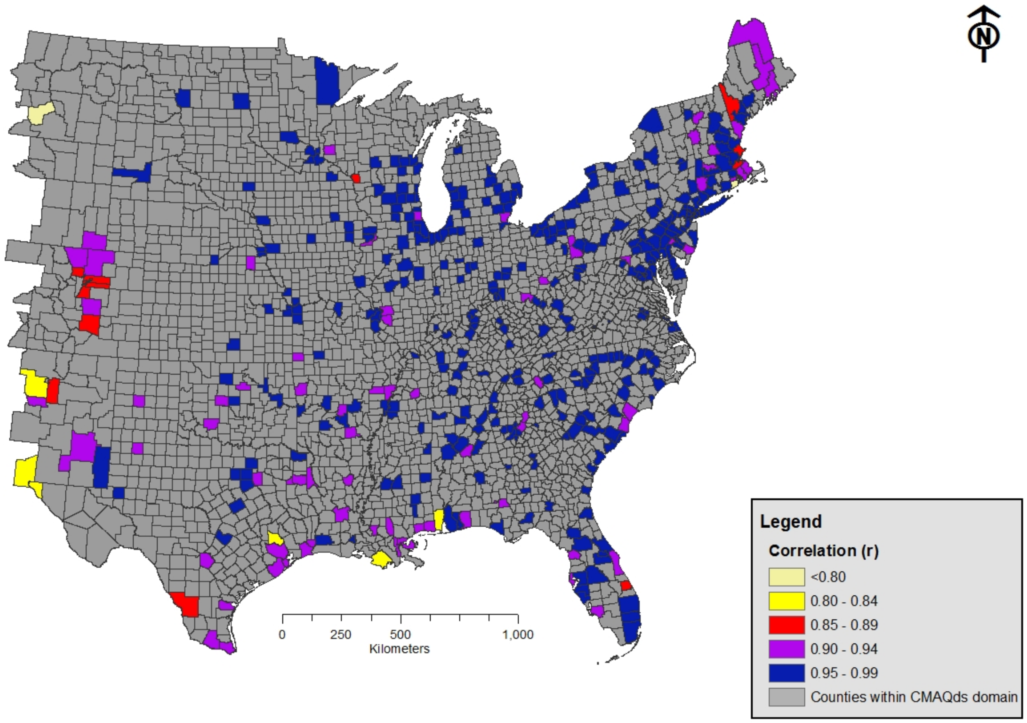
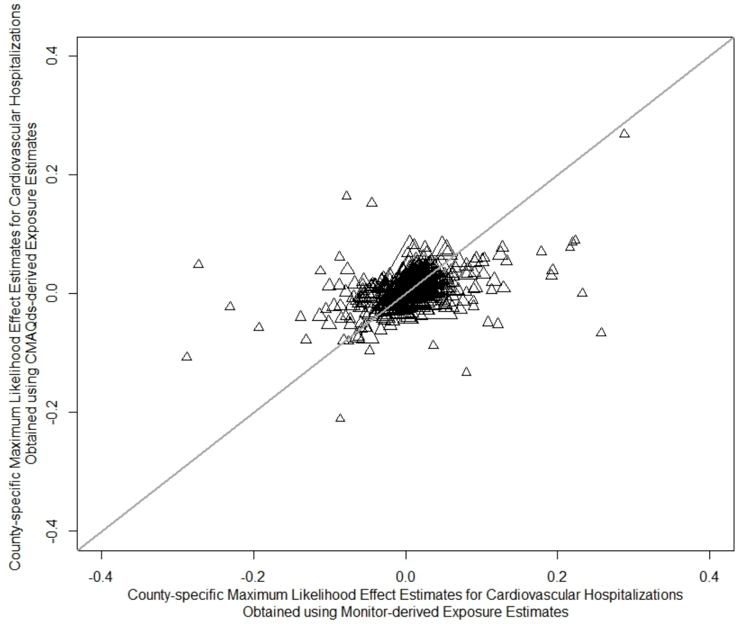
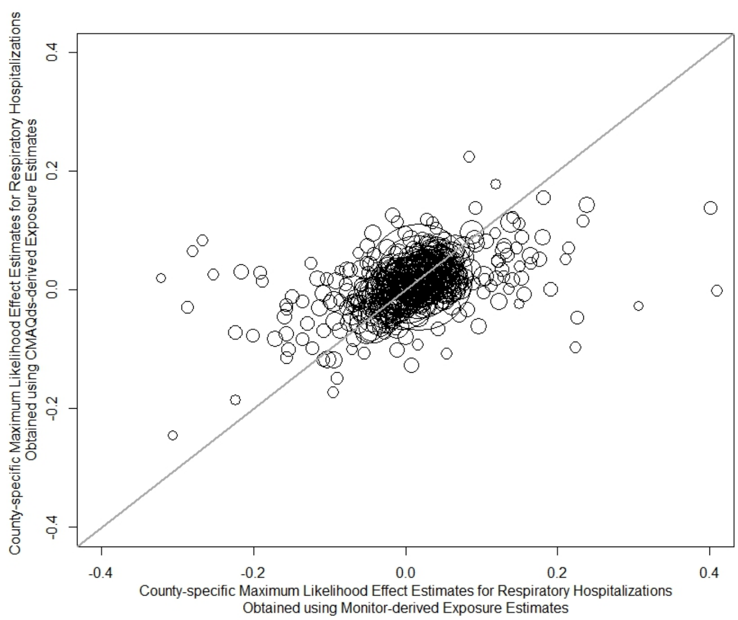


Figure S2. County-specific correlation between exposure estimates derived from observed data and CMAQds simulated $PM_{2.5}$ concentrations for the 418 counties with monitoring data and populations ≥50,000, 2002-2006 (data from 2000 U.S. Census; map drawn using ArcGIS). This map shows correlations between county level monitor-derived daily exposure estimates for daily county level CMAQds-derived exposure estimates. Only counties with monitoring data and populations ≥50,000 are included in the comparison





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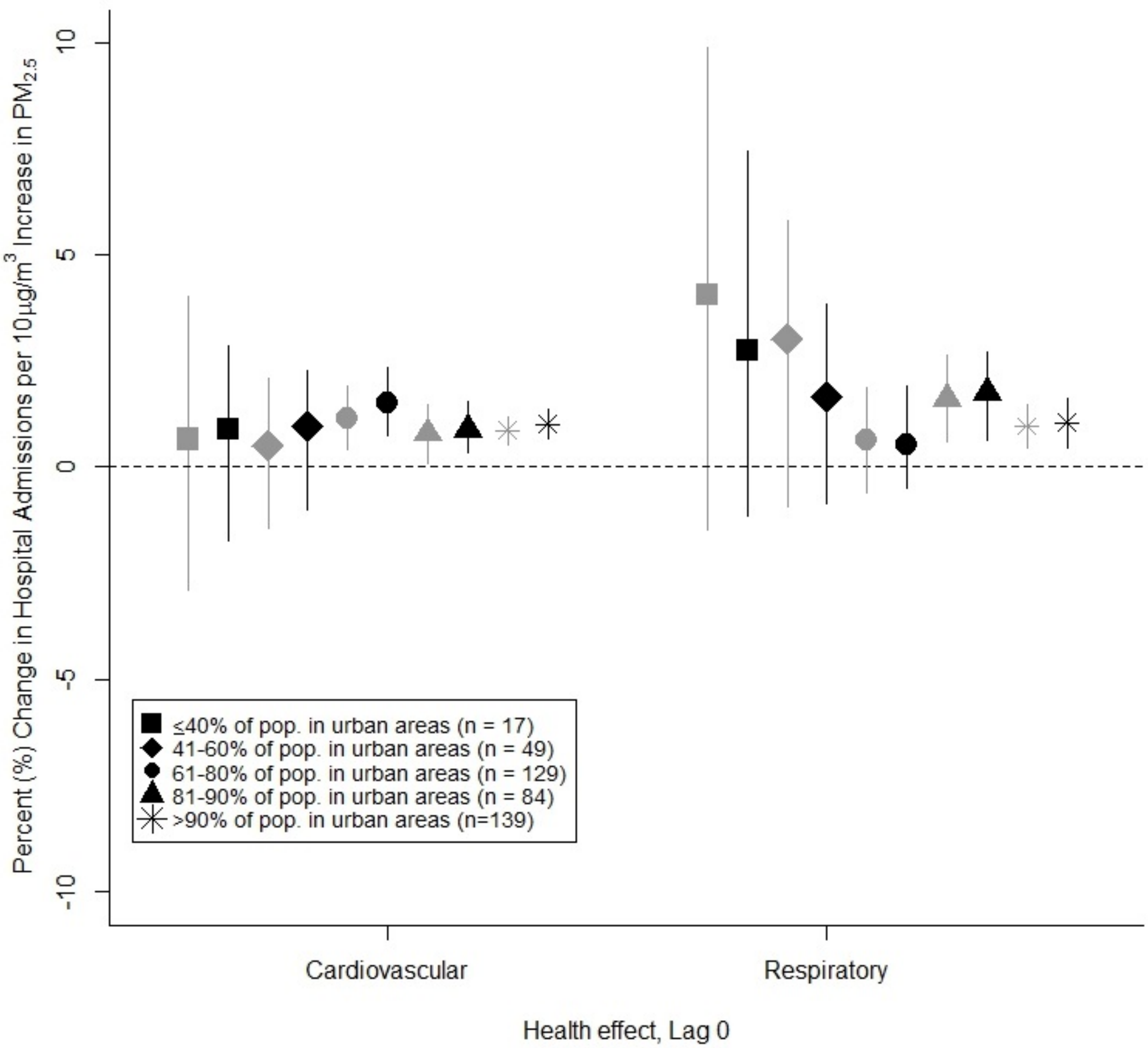

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References

Zhang Y, Liu P, Pun B, Seigneur C. 2006. A comprehensive performance evaluation of MM5-CMAQ for the Summer 1999 Southern Oxidants Study episode - Part I: Evaluation protocols, databases, and meteorological predictions. Atmos Environ 40: 4825-4838.